

### Remarks

The January 18, 2007 Official Action has been carefully reviewed. In view of the amendments submitted herewith and the following remarks, favorable reconsideration and allowance of this application are respectfully requested.

At the outset it is noted that a shortened statutory response period of three (3) months was set forth in the January 18, 2007 Official Action. Therefore, the initial due date for response was April 18, 2007. A petition for a 2 month extension is presented with this response, which is being filed within the two month extension period.

Claim 6 has been objected to for stating the "ligand system of claim 4." Applicants have amended claim 6 to depend from product claim 5, thereby overcoming the instant objection.

Claims 1-15 have been rejected under 35 U.S.C. §112, second paragraph for alleged indefiniteness on several grounds.

The Examiner has also rejected claims 1, 2, 5, 7, 8, 10, and 14 and claims 1, 2, 5, 7, 13, and 14 under 35 U.S.C. §102(b) as allegedly anticipated by U.S. Patent 5,260,004 and U.S. Patent 4,830,952, respectively.

Lastly, the Examiner has rejected claims 3, 4, 6, 11, and 15 under 35 U.S.C. §103(a) as allegedly unpatentable over the '004 patent in view of U.S. Patent 5,223,409. Claims 9 and 10 have also been rejected under 35 U.S.C. §103(a) as allegedly unpatentable over the '004 patent in view of Sivars et al. (J. Chromatogr. B (2000) 743:307-316).

The foregoing objection and rejections constitute all of the grounds set forth in the January 18, 2007 Official Action for refusing the present application.

In accordance with the instant amendment, claims 1, 3, and 4 have been amended and claim 16 has been added. Support for the amendment to claim 1 can be found, for example, at pages 12-13 and Figure 2. Support for new claim 16 can be found throughout the specification including, for

example, at page 13 and Figure 3. Lastly, pages 3 and 7, for example, provide support for the amendments to claims 3 and 4.

No new matter has been introduced into this application by reason of any of the amendments presented herewith.

In view of the present amendment and the reasons set forth in this response, Applicants respectfully submit that the objection to claim 6; the 35 U.S.C. §112, second paragraph rejections of claims 1-15; the 35 U.S.C. §102(b) rejections of claims 1, 2, 5, 7, 8, 10, 13, and 14; and the 35 U.S.C. §103(a) rejections of claims 3, 4, 6, 9-11, and 15, as set forth in the January 18, 2007 Official Action, cannot be maintained. These grounds of objection and rejection are, therefore, respectfully traversed.

**CLAIMS 1-15, AS AMENDED, SATISFY THE DEFINITENESS REQUIREMENT  
OF 35 U.S.C. §112, SECOND PARAGRAPH**

The Examiner has rejected claims 1-15 under 35 U.S.C. §112, second paragraph for alleged indefiniteness on the following grounds.

First, the Examiner contends that it is unclear whether a solid surface or a solid surface with a lipid bilayer is being contacted in step a) of claim 1. In an effort to eliminate any ambiguity perceived by the Examiner, Applicants have amended claim 1 to recite "providing a solid surface in contact with a lipid bilayer, wherein said lipid bilayer comprises lipids conjugated to a first specific binding pair member."

Second, the Examiner contends that the term "functionally" in steps b) and c) of claim 1 and in claim 2 is indefinite. Applicants have deleted this term from the claims, thereby rendering this rejection moot.

Third, the phrases "said first binding pair member," "said second member," "said second binding pair member," "said lipid," and "said first member" in steps b) and c) of claim 1 lack antecedent basis. Applicants have amended the phrases to refer to a "first specific binding pair member" or a "second

specific binding pair member," which have clear antecedent basis in the claims.

Fourth, the Examiner has rejected claims 3, 4, 11, and 12 for allegedly omitting an essential step. The Examiner asserts that it is unclear how the recited cell and virus are involved in the claimed methods. Applicants have amended claims 3 and 4, from which claims 11 and 12 depend, to recite contacting the lipid bilayer with the cell or virus.

Fifth, the Examiner has rejected claim 6 for containing abbreviations which allegedly lack antecedent basis in the claim and in the specification. Applicants respectfully disagree with the Examiner's position. The ligands recited in claim 6 have antecedent basis in the specification at page 3, lines 7-15. Applicants have also amended claim 6 to provide the full name of the abbreviations in the claim. Support for "major histocompatibility complex (MHC)" and "T cell receptor (TCR)" can be found, for example, at page 9, line 33 and page 10, line 1. Additionally, Applicants respectfully submit that the abbreviations TNFR, FasL, HSP, CKR, and IL were well known by those of skill in the art at the time of the instant invention. Indeed, Applicants submit herewith pages 186 and 291 of *Immunobiology: The Immune System in Health and Disease* (4<sup>th</sup> Edition, Janeway et al., 1999, Garland Publishing, New York) which show that FasL is Fas ligand and TNFR is tumor necrosis factor receptor, respectively. Additionally, pages 480 and 557 of *The Encyclopedia of Molecular Biology* (Ed. Kendrew, 1994, Blackwell Science, Cambridge, MA) demonstrate that HSP stands for heat shock protein and IL stands for interleukin, respectively. Lastly, CKR is an abbreviation for chemokine receptor as evidenced, for example, by Kim et al. (J. Clin. Invest. (2001) 108:1331-9; Abstract).

Claim 7 has also been rejected for recitation of the trademark BIACORE. Applicants have deleted the term "Biacore" from the claim, thereby rendering the instant claim moot. Applicants note that Biacore™ chips are sensor chips and,

therefore, still encompassed by the instant claims.

In view of all of the foregoing, Applicants respectfully submit the instant rejections of claims 1-15 under 35 U.S.C. §112, second paragraph are untenable. Withdrawal of these rejections is respectfully requested.

**CLAIMS 1, 2, 5, 7, 8, 10, 13 AND 14, AS AMENDED, ARE NOT  
ANTICIPATED BY THE REFERENCES CITED BY THE EXAMINER**

The Examiner has also rejected claims 1, 2, 5, 7, 8, 10, and 14 and claims 1, 2, 5, 7, 13, and 14 under 35 U.S.C. §102(b) as allegedly anticipated by the '004 patent and the '952 patent, respectively. It is the Examiner's position that the '004 and '952 patents describe methods for producing a fluid planar lipid layer based membrane anchored ligand system as instantly claimed.

In order to constitute evidence of lack of novelty under 35 U.S.C. §102(b), a prior art reference must identically disclose each and every element of the rejected claim. In re Bond, 15 U.S.P.Q.2d 1566 (Fed. Cir. 1990).

Applicants respectfully disagree with the Examiner's position. However, in the sole interest of expediting prosecution of the instant application, Applicants have amended the claims to recite that the lipid layer is a bilayer. Notwithstanding the Examiner's contentions to the contrary, the '004 and '952 patents fail to teach a lipid bilayer. Indeed, the '004 patent describes the formation of "an ordered monolayer" (see Abstract; column 2, lines 11-28; Figure 2C, and claims 1, 14, and 15) and wholly fails to teach or suggest the use of a lipid bilayer.

Similarly, the '952 patent fails to teach or suggest lipid bilayers as instantly claimed. As understood in the art and as depicted in Figure 2 of the instant invention, lipid bilayers comprise two layers of lipids wherein the hydrophilic head groups of the lipid are on the outside of the bilayer and the hydrophobic tails of the lipids in each layer oppose each other and are inside the lipid bilayer. While the '952 patent

describes multilayers, the '952 patent fails to describe a bilayer and, more specifically, fails to describe a bilayer comprising the hydrophilic head groups on the exterior and the hydrophilic tails on the interior.

Additionally, the '952 patent fails to teach lipids conjugated to a first specific binding pair member and ligands linked to a second specific binding pair member whereby contacting the lipid with the first specific binding pair member to the second specific binding pair member linked to the ligand results in anchoring of the ligand to the lipid. Based on page 5 of the instant Official Action, it appears that the Examiner contends that the hydrophilic head group of a lipid of the '952 patent can comprise choline as the  $L^2$  group and a counter ion Z. The Examiner contends that the contacting of these groups results in anchoring of the ligand to the lipid as evidenced by schematic in the middle of column 4. Applicants strenuously disagree with the Examiner's position. As stated hereinabove, there simply is no teaching or suggesting in the '952 patent that the ligands are anchored to each other. The Examiner has based his opinion on the mere "proximity of "L" groups between the top layer and the middle layer." This is simply speculation based on a static, simple sketch. Furthermore, the Examiner has wholly failed to provide evidence or any reason as to why the head groups suggested by the Examiner would even have affinity for each other, let alone be anchored to each other. It is a well settled premise of patent law that a reference that is ambiguous as to the presence or description of a claim element cannot anticipate a claim.

In view of all of the foregoing, it is evident that the rejections of claims 1, 2, 5, 7, 8, 10, 13, and 14 under 35 U.S.C. §102(b) are untenable. Withdrawal of the rejections is respectfully requested.

**CLAIMS 3, 4, 6, 9-11, AND 15, AS AMENDED, ARE NOT RENDERED  
OBVIOUS BY THE REFERENCES CITED BY THE EXAMINER**

The Examiner has rejected claims 3, 4, 6, 11, and 15 and claims 9 and 10 under 35 U.S.C. §103(a) as allegedly unpatentable over the '004 patent in view of the '409 patent and Sivars et al., respectively. The '409 patent allegedly describes the optimization of affinity separation with cells and viruses and Sivars et al. allegedly describes polyhistidine-metal ion binding pairs. It is the Examiner's position that it would have been obvious to a skilled artisan to combine the teachings of the '409 patent and Sivars et al. with the '004 patent to arrive at the instantly claimed invention.

Applicants respectfully disagree with the Examiner's position. However, as stated hereinabove, Applicants have amended the instant claims to recite a lipid bilayer. The '004 patent is concerned with lipid monolayers and wholly fails to teach and or suggest a lipid bilayer. The '409 patent and Sivars et al. also fail to teach a lipid bilayer and, therefore, do not supplement the deficiency in the '004 patent disclosure.

Accordingly, the instant rejections of claims 3, 4, 6, 9-11, and 15 under 35 U.S.C. §103(a) cannot be reasonably maintained. Applicants respectfully request these rejections be withdrawn.

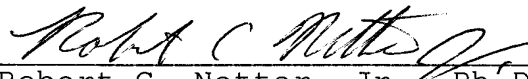
**CONCLUSION**

In view of the amendments presented herewith, and the foregoing remarks, it is respectfully urged that the objection and rejections set forth in the January 18, 2007 Official Action be withdrawn and that this application be passed to issue.

In the event the Examiner is not persuaded as to the allowability of any claim, and it appears that any outstanding issues may be resolved through a telephone interview, the

Examiner is requested to call the undersigned at the phone number given below.

Respectfully submitted,  
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Enclosures: *Immunobiology: The Immune System in Health and Disease*, 4<sup>th</sup> Edition, Janeway et al., 1999, Garland Publishing, New York, pages 186 and 291;  
*The Encyclopedia of Molecular Biology*, Ed. Kendrew, 1994, Blackwell Science, Cambridge, MA, pages 480 and 557;  
Kim et al., J. Clin. Invest. (2001) 108:1331-9; Abstract